PAPERS READ.

ON THE OCCURRENCE OF BARITE (BARYTES) IN THE HAWKESBURY SANDSTONE NEAR SYDNEY.

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(Communicated by J. H. Maiden, F.L.S., &c., Curator of the Museum.)

Uninteresting as the Hawkesbury sandstone around Sydney is generally considered to be, especially from a collector's point of view, and although the inducement to search for either metallic or non-metallic minerals is not great, yet sometimes one is rewarded for a diligent search among the cracks and crannies of old or recent excavations.

In a quarry not far from Cook's River, five miles west from Sydney, and adjoining the Illawarra-road in the borough of Marrickville, I recently found Barytes in very perfect and pure crystals. They have a vitreous lustre, which on the most perfect crystals is very brilliant; it was their sparkling in the sun that first drew my attention to them. They are in many instances as transparent as glass, and crystallise for the most part in modified tables of the right rectangular pyramid, the domes being cut off by the basal pinakoids. In many crystals the faces of the right rhombic prism are distinct; the symbols for the majority of the most perfect crystals are, therefore :— $\infty P + \breve{P}\ \infty + \breve{P}\ \infty + OP$. The pinakoids $\infty \bar{P}\ \infty$ and $\infty \breve{P}\ \infty$ being occasionally, although seldom, developed. The faces of the right rhombic prism are extended upon the macro-diagonal axis, and in a few larger crystals the extension has continued to the almost extinction of the macro-domes.

The purest and best formed crystals are of small size, but some measure $\frac{3}{4}$ inch on the macro-diagonal, though these larger crystals are not so pure nor so transparent; their thickness is $\frac{1}{16}$ inch.

The purest crystals were taken for qualitative analysis; just a trace of calcium was found, not a trace of strontium, no acid but sulphuric, the crystals consisting almost entirely of sulphate of barium. To remove any adhering ferric oxide or other accidental impurity they were boiled with dilute acid before fusion.

An exhaustive quantitative analysis would have been of little value, as it was impossible to separate the crystals from the grains of sand adhering to them; but two determinations were made to discover, if possible, in what proportion the sulphate of calcium was present. In the first ·4478 gram. SO_4 was obtained; this if combined entirely with barium would give 1·0861 gram. Ba SO_4; the bases were dissolved and precipitated by sulphuric acid and 1·0876 gram. obtained; this does not allow for any calcium, and as the second determination gave almost identical results, we may consider, allowing for slight errors, that the pure transparent crystals are Ba SO_4, the calcium being present in very minute quantities. Ba = 136·84; S = 32.; O = 16.

It is in the conglomerate, which consists of boulders of shale and ironstone cemented together with hardened sand, that the barytes is found. The conglomerate overlies the upper solid rock, and is also found beneath the same bed, a distance of 10 or 12 feet separating the two. Shale is found embedded in the solid rock, but the barytes does not appear to exist there, although it is found both in the upper and lower conglomerates.

The shale contains much mica.

I have not succeeded in obtaining the barytes in any large quantity, the conglomerate not being of large extent, although there is no reason to suppose that it is restricted to that deposit, and perhaps now that its presence in the immediate neighbourhood of Sydney has been ascertained, larger quantities may be found.

In the many crystals examined no new faces were seen, therefore further description is not required.

The best specimens have been placed in the Technological Museum Collection.